

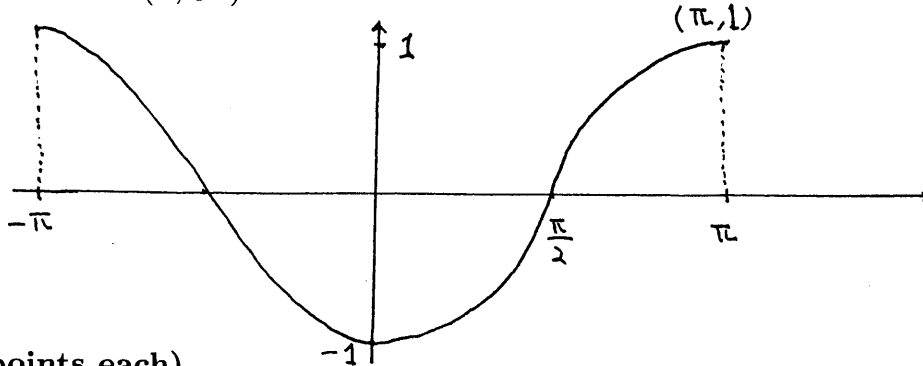
Midterm II

1. (10 points each)

- (1) Graph the function $y = 3^{x-2} - 1$. Label y -intercept, x -intercept and the asymptote.
- (2) The following is the graph of a function $f(x)$. Graph the function

$$f\left(-\left(x - \frac{\pi}{3}\right)\right) - 1.$$

Label the points in the graph corresponding to the given points $A = \left(\frac{\pi}{2}, 0\right)$ and $B = (\pi, 1)$



2. (5 points each)

- (1) Find the solution sets for the inequality

$$\log_{\frac{1}{3}}(x + 2) > -2$$

- (2) Solve the equation

$$\log_2(x + 2) + \log_2(x - 1) = 2$$

- (3) Solve the equation $2^{(-5x+1)} = 4^{3x}$.

- (4) Find the value a such that $\log_a 81 = 4$.

3. (5 points each) Suppose $A = \log_b 2$, $B = \log_b 3$ and $C = \log_b 5$. Express the followings in terms of A , B and C .

- (1) $\log_b 120$
- (2) $\log_{3b} 4.5$

4. (10 points) How long will it take for an investment to double in value if the interest rate is 8.5 % per year, compounded semiannually?

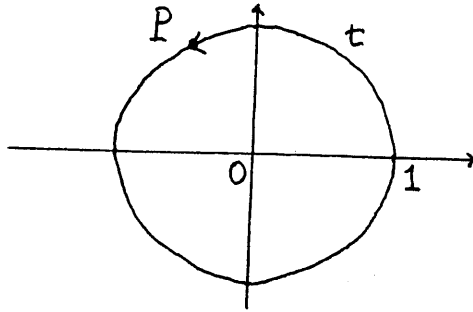
5. (5 points each) The point P in the figure at the left has y -coordinate $\frac{4}{5}$. Find each of the following.

(1) $\sin t$

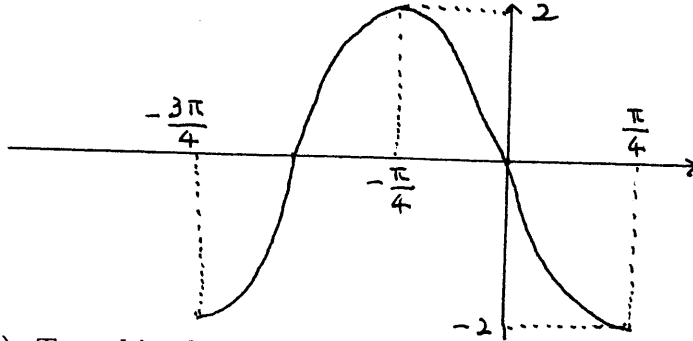
(2) $\cos(-t)$

(3) $\tan(\pi - t)$

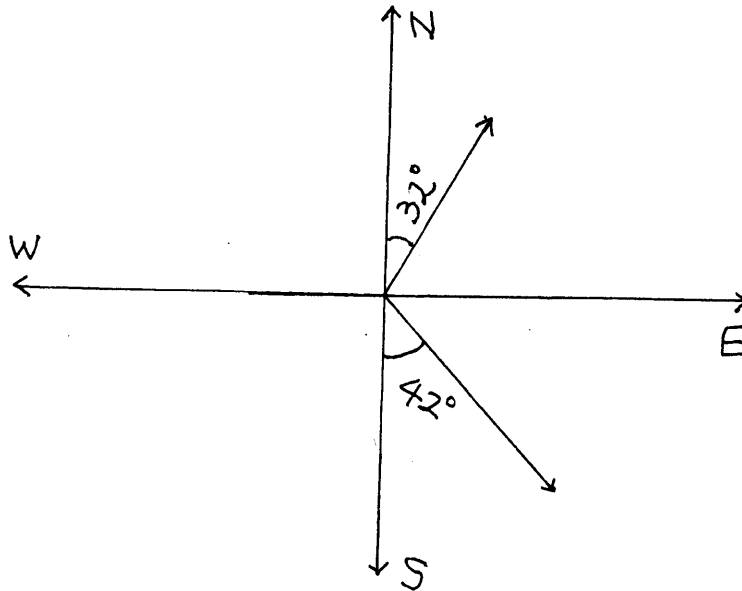
(4) $\sec(\pi + t)$



6. (10 points) The graph shown is one period of a function of the form $y = a \cos k(x - b)$. Determine the function, i.e., find the values of a , k , b .



7. (10 points) Two ships leave a port at the same time. One travels at 20 mi/h in a direction $N32^\circ E$, and the other travels at 28 mi/h in a direction $S42^\circ E$. How far apart are the two ships after 2 hours?



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